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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/855,458	05/15/2001	Patrick Denis Lincoln	10454-016001	9224

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BOSTON, MA 02110

EXAMINER

SMITH, CAROLYN L

ART UNIT	PAPER NUMBER
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1631

DATE MAILED: 03/25/2003

12

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/855,458

Applicant(s)

LINCOLN ET AL.

Examiner

Carolyn L Smith

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-109 is/are pending in the application.
- 4a) Of the above claim(s) 12,13,15,28,29,31,38,60,61,63 and 77-95 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-8,10,11,14,16-20,22-25,27,30,34-37,39-52,54,56,57,59,62,64-76,96-98,100-103 and 105-108 is/are rejected.
- 7) ☒ Claim(s) 4,9,21,26,32,33,53,55,58,99,104 and 109 is/are objected to.
- 8) ☒ Claim(s) 1-109 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

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Detailed Action

Applicants' elections without traverse of Group 1 (claims 1-76 and 96-109) and first specie (symbols which include drugs or exogenous agents), second specie (state which is associated with a disease or disorder), third specie (state which is associated with cell proliferation), and fourth specie (iterative inference engine practice) in Paper No. 10, filed 1/13/03, are acknowledged. Claims 77-95 are withdrawn from consideration as being drawn to non-elected Groups. Claims 12, 13, 15, 28, 29, 31, 38, 60, 61, and 63 are withdrawn from consideration as being drawn to non-elected species.

The information disclosure statement filed 5/15/01 fails to comply with the provisions of 37 CFR 1.97, 1.98, and MPEP § 609, because reference AE and AJ lack a publication date on the actual copy, only a journal name was noted. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609, ¶ C(1).

The corrected drawings, filed 1/13/03, have been approved by the draftsman.

Claims herein under examination are 1-11, 14, 16-27, 30, 32-37, 39-59, 62, 64-76, and 96-109.

Specification

The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code, such as on page 6, line 25; page 10, line 17; and page 26, lines 13-14. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

The disclosure is objected to because of the following informality: “algrebraic” is misspelled on page 11, line 2. Correction of this error and any other spelling errors is requested.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 6, 23, 41, 101, and 105 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 6, 23, and 101 recite the term “reflective” which is vague and indefinite. It is unclear what is meant by this term and what determines the rules to be “reflective.” Clarification of the metes and bounds of this term via clearer claim wording is requested.

Claim 41 recites the phrase “*infinite* substitution chains are detected” which is vague and indefinite. It is unclear how one can detect that the chains are infinite or at what point or threshold the detection is declared infinite. Clarification of this phrase via clearer claim wording is requested.

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Claim 105 recites the phrase "the software is further to cause the processor to..." which is vague and indefinite. It is unclear what is further done with the software. Clarification of this phrase via clearer claim wording is requested.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 5, 7-8, 10-11, 14, 34-37, 51-52, 54, 56-57, 59, and 62 are rejected under 35 U.S.C. 102(b) as being anticipated by Kohn (Molecular Biology of the Cell, 1999, Vol. 10, pages 2703-2734).

Kohn discloses a method that can be used in the generation of functional models (page 2703, col. 2, lines 7-8 and 16-18) to organize interactions via symbols in the form of a diagram, map, and /or database (abstract, lines 1-2 and 5-6). Kohn discloses representing modifications by unique graphical constructs (page 2704, col. 1, lines 21-24) as well as actions or effects of each molecular species or interaction (page 2704, col. 1, lines 26-27). Kohn discloses the representation of all possible combinations is impractical; however, it is important to represent important combinations (page 2704, col. 1, lines 33-36). Kohn discloses symbols, rules, and the representation of interactions as lines (page 2704, col. 1, lines 37-42 and Figure 1) as stated in

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claims 1, 11, and 34. Kohn discloses the rule that molecular species should only appear once in the diagram and various interactions are represented as various types of lines connecting the species (page 2704, col. 1, lines 37-42). Kohn discloses the associative relationship between at least two molecular species in Figure 6 as well as the substitution of one symbol by another shown in the seventh symbol example in Figure 1 as stated in claims 1, 2, 34, and 51. The substitution of one symbol by another is interpreted to satisfy the idea set forth in the specification which states "the rewrite process detects multiple alternative states, symbols present in all alternative states can be displayed with one color" (page 17, lines 20-23). Kohn discloses alternative results due to the binding of different proteins at the same site (page 2704, col. 2, lines 19-23 and Figure 2) and a representation of effects specific to any combination of interactions (page 2704, col. 2, lines 25-29). Kohn discloses the grouping of molecular components into subsystems according to mutual interactions or functional coherence (page 2707, col. 1, lines 21-23 and page 2715, col. 1, lines 44-45) which is reasonably interpreted as an organization of hierarchical classes as stated in claims 8 and 57. Kohn disclose 20 different possible states due to possible interactions in one example of an E2F recognition element (page 2712, col. 1, lines 8-10) as stated in claims 3 and 52. Kohn disclose a positive feedback loop that can be traced in the map (page 2712, col. 2, lines 13-14) as stated in claims 5 and 54. Kohn discloses symbols that are categorized, or typed, by their different characteristics (Figure 1) as stated in claims 7 and 56. Kohn discloses under what conditions the rule lines are to be used via their descriptions in Figure 1 as stated in claims 10 and 59. Kohn discloses the interactions with drugs (page 2715, col. 1, lines 8-16 and 21-24) as stated in claims 14 and 62. Kohn discloses the map complexity can be used to formulate specific functional hypotheses with the aid of computer

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simulations (page 2715, col. 1, lines 39-42) as stated in claims 1 and 34. Kohn discloses colored symbols to represent covalent modifications and gene expression in Figure 6 (page 2712, col.1, Figure 6 caption, lines 12-13) as stated in claims 35-37.

Thus, Kohn anticipates the limitations in claims 1-3, 5, 7-8, 10-11, 14, 34-37, 51-52, 54, 56-57, 59, and 62.

Claim 1 is rejected under 35 U.S.C. 102(e)(2) as being anticipated by Yoshida et al (P/N 6,438,496 B1).

Yoshida et al. disclose a method and apparatus that enables the recognition of a characteristic included in a symbolic sequence that was not previously recognized (col. 1, lines 8-17). Yoshida et al. disclose genetic information specified by symbolic sequence (col. 1, lines 20-24). Yoshida et al. disclose a symbolic sequence that is converted to a parallel sequence of partial symbolic sequences (col. 1, lines 57-60). Yoshida et al. disclose alternatives of positional relation alignments (col. 2, lines 3-12). Yoshida et al. disclose the converted parallel sequence is outputted using one or more expression means such as hue, lightness, or saturation of color (col. 2, lines 17-20). Yoshida et al. disclose operations, or rules, such as the one to extract letters from the parallel sequence of the partial symbolic sequence (col. 2, lines 26-31 and col. 3, lines 52-63) which is reasonably interpreted as a form of substitution. Yoshida et al. disclose Figure 14 which represents extraction of symbolic sequence I to be processed with changing the initial point, from a symbolic sequence M (col. 5, lines 6-8). Yoshida et al. disclose using a computer processor for the above-mentioned method.

Thus, Yoshida et al. anticipate the limitations in claim 1.

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Claims 1, 2, 7-8, 11, 14, 16-17, 34-37, 39-40, 44-51, 56-57, 62, and 64-76 are rejected under 35 U.S.C. 102(e)(1) as being anticipated by Allen et al. (Patent Application Publication US 2002/0068269).

Allen et al. disclose a method and system for examining a biological system (page 1, paragraph 0002). Allen et al. disclose the invention to predict interactions between biological elements (page 1, paragraph 0005). Allen et al. disclose an output module and a graphical display of the interactions in Figure 14 (and page 3, paragraph 0027), including symbols of biological elements and lines representing substitutions or associations as stated in claims 1, 2, 11, 51, and 67. The substitution of one symbol by another is interpreted to satisfy the idea set forth in the specification which states "the rewrite process detects multiple alternative states, symbols present in all alternative states can be displayed with one color" (page 17, lines 20-23). Allen et al. disclose an inference engine linked to a database of known cellular components and reactions to generate signal cascades (page 1, paragraph 0007). Allen et al. disclose using the system and method for molecular examination of the interactions and the effects of molecular interventions by genetic variation, drugs or toxic substances (page 1, paragraph 0009 and page 5, paragraph 0047) as stated in claims 14, 48, 62, and 75. Allen et al. disclose examining functional, genotypic profiles, and microarrays (page 1, paragraph 0009; page 5, paragraphs 0047 and 0048) as stated in claims 35-38, 47, 68, and 71. Allen et al. disclose using the system and method by generating results using a simulation module that includes an inference engine (page 1, paragraph 0010) as stated in claims 1, 34, and 66. Allen et al. disclose displaying aspects of the results either textually and/or graphically (page 1, paragraph 0011 and page 5, paragraph 0047). Allen et al. disclose a static graphical display or map which may be saved as a

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format file (page 3, paragraph 0032). Allen et al. disclose a query made to the simulation module about a protein differentially expressed and the generation of information of associated diseases as well as models involving pathology or drugs (page 4, paragraph 0036) as stated in claims 35, 39, and 69. Allen et al. disclose defining cell structures and types to establish a hierarchy of types and structures (page 4, paragraph 0038) as stated in claims 8 and 57. Allen et al. disclose the method and system may include concepts relating to cancer (page 4, paragraph 0040) as stated in claims 40, 45, 50, 70, and 73. Allen et al. disclose the use of attributes featuring a property of a concept or event that may have an associated value (page 4, paragraph 0043). Allen et al. disclose using the system and method to examine the character of cell function under pathologic versus normal conditions (page 5, paragraph 0049) which is reasonably interpreted as a comparison to a reference state as stated in claims 44 and 72. Allen et al. disclose a resultant list of drug targets can be reprocessed by the simulation module (page 5, paragraph 0050) which is reasonably interpreted as an iterative process as stated in claim 66. Allen et al. disclose incorporating multiple cell types to form tissues, using these tissues to form organs, and using these organs to form organ systems in the inference engine and simulation module (page 5, paragraph 0052) as stated in claims 7, 16, 17, 56, 64-65, and 76.

Thus, Allen et al. anticipate claims 1, 2, 7-8, 11, 14, 16, 17, 34-37, 39-40, 44-51, 56-57, 62, and 64-76.

Claims 1, 2, 7-8, 11, 14, 16-17, 34-37, 39-40, 42-51, 56-57, 62, and 64-76 are rejected under 35 U.S.C. 102(e)(1) and (2) as being anticipated by Allen et al. (Patent Application Publication US 2002/0068269) and Fant et al. (P/N 5,805,461).

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Allen et al. describe the limitations of claims 1, 2, 7-8, 11, 14, 16-17, 34-40, 44-51, 56-57, 62, and 64-76. Allen et al. state the system in their invention includes a display module with graphical representations (page 2, paragraph 0013). However, Allen et al. do not specifically describe a wiring diagram, it is inherent that a graphical representation can take the form of a wiring diagram as stated in claim 42. Fant et al. describe a method and system featuring interactions (col. 12, lines 4-8) with graphical representations in the form of wiring diagrams (Figures 13-14) as stated in claims 42-43. This method and system involves symbolic process expression (col. 5, lines 31-32) with associative and transforming rules with values (col. 15, lines 2-3). As MPEP 2131.01 states, "To serve as an anticipation when the reference is silent about the asserted inherent characteristic, such gap in the reference may be filled with recourse to extrinsic evidence. Such evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." *Continental Can Co. USA v. Monsanto Co.*, 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991).

Thus, Allen et al. and Fant et al. anticipate claims 1, 2, 7-8, 11, 14, 16-17, 34-37, 39-40, 44-51, 56-57, 62, and 64-76.

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 18-22, 24-25, 27, 30, 96-100, 102-103, and 106-108 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kohn (Molecular Biology of the Cell, 1999, Vol. 10, pages 2703-2734) and Allen et al. (Patent Application Publication US 2002/0068269).

Kohn and Allen et al. describe the limitations of claims 18-20, 22, 24-25, 27, 30, 96-98, 100, 102-103, and 106-108 as seen in the above-mentioned 102(a) and 102(b) rejections. Kohn and Allen et al. lack a machine-readable medium having encoded the limitations of claims 18-20, 22, 24-25, 27, 30, 96-98, 100, 102-103, and 106-108. However, it would have been obvious to one of ordinary skill in the art at the time the invention to store any particular information from the computer to a machine-readable medium in order to integrate vast information and perform with complete knowledge all of the players involved in order to simulate pathways, as stated by

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Allen et al. (page 1, paragraphs 0004 and 0006). One of ordinary skill in the art would have been motivated to store sequence information on a computer readable medium just as a patent is already on a computer readable medium as part of the PTO Patenting search system which is publically available. Thus, Kohn and Allen et al. motivate the limitations in claims 18-20, 22, 24-25, 27, 30, 96-98, 100, 102-103, and 106-108.

Conclusion

Claims 4, 9, 21, 26, 32-33, 53, 55, 58, 99, 104, and 109 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR §1.6(d)). The CM1 Fax Center number is either (703) 308-4242 or (703) 305-3014.

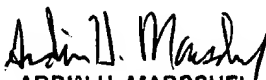
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carolyn Smith, whose telephone number is (703) 308-6043. The examiner can normally be reached Monday through Friday from 8 A.M. to 4:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward, can be reached on (703) 308-4028.

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Any inquiry of a general nature or relating to the status of this application should be directed to Legal Instruments Examiner Tina Plunkett whose telephone number is (703) 305-3524 or to the Technical Center receptionist whose telephone number is (703) 308-0196.

March 20, 2003


ARDIN H. MARSCHEL
PRIMARY EXAMINER

Notice of References Cited

Application/Control No.

09/855,458

Applicant(s)/Patent Under
Reexamination
LINCOLN ET AL.

Examiner

Carolyn L. Smith

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U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-6,438,496-B1	08-2002	Yoshida et al.	702/19
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.